

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

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Applicant's or agent's file reference BPO 9861	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/04855	International filing date (day/month/year) 10.11.2003	Priority date (day/month/year) 15.11.2002
International Patent Classification (IPC) or both national classification and IPC C10L1/24		
Applicant BP OIL INTERNATIONAL LIMITED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
  - This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.
3. This report contains indications relating to the following items:
  - I  Basis of the opinion
  - II  Priority
  - III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV  Lack of unity of invention
  - V  Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI  Certain documents cited
  - VII  Certain defects in the international application
  - VIII  Certain observations on the international application

Date of submission of the demand 08.06.2004	Date of completion of this report 21.02.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Tatus, W Telephone No. +49 89 2399-2693



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB 03/04855

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-7 as originally filed

**Claims, Numbers**

1-15 as originally filed

**Drawings, Sheets**

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

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5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N) Yes: Claims 1-15  
No: Claims

Inventive step (IS) Yes: Claims  
No: Claims 1-15

Industrial applicability (IA) Yes: Claims 1-15  
No: Claims

**2. Citations and explanations**

**see separate sheet**

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EXAMINATION REPORT - SEPARATE SHEET**

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**box V**

SAE paper 982649 reveals (see figure 2) that an increased sulphur content in fuel results in increased particulate emissions, which is also expressed in the description of the application, page 1, lines 12, 13.

It is well known to a person skilled in the art that a part of the engine lubricating oil is burnt in the engine.

Sulphur burnt in the engine is the sum of sulphur in the fuel and sulphur from lubricating oil. This is also expressed in the description of the application, page 3, lines 9, 10 "..., the gas formed from combustion of the fuel (and lube oil) contacts the filter,...".

Knowing the teaching of SAE paper 982649 it would not make any sense to lower the sulphur content in the fuel with the aim of lowering particulate emissions and simultaneously using an lubricating oil with a high sulphur content which again increases the sulphur in the gas formed from the combustion of the fuel and the lube oil.

The term "nucleation mode particles" is not explicitly mentioned in SAE paper 982649, however the total particulate matter emitted include "nucleation mode particles".

In the application **a particle size measurement was performed** (with and without a CRT catalyst as known from the paper "Springing the trap") with the result that a lower overall sulphur content (fuel and lube oil) results in a reduced formation of "nucleation mode particles". Therefore in subject-matter of the independent claims 1 and 2 cannot be seen an inventive step (Art. 33(3) PCT).

Subject- matter of dependent claims 3 to 5, 7 and 8 is either known from "Springing the trap" or lies within the measures of a skilled person without performing an inventive step (Art 33(3) PCT). Claim 6 defines the diameter of nucleation mode particles and require an independent claim which fulfill the requirements of the Art. 33 PCT.

Subject-matter of claims 9 and 10 concerning the lube oil sulphur content seem to be obvious in the direction of as low as possible.

Subject-matter of claims 11 to 15, concerning the known fact that the use of a low sulphur fuel enables the amount of anti-wear agents containing phosphorus such as eg.

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ZDDP (zinc dialkyl dithiophosphate) can be reduced without any adverse effect on the anti-wear and the replacement of ZDDP by molybdenum containing components (claim 12) only have an indirect relation to the sulphur content in the fuel and the lube oil in order to reduce particulate emissions and therefore require an independent claims which fulfil the requirements of Art. 33 PCT.

The skilled person knows the general line, "reduced sulphur burnt results in reduced particulate emissions". For environmental reasons a skilled person will minimize the sulphur content as well in fuel as in lube oil since both are burnt in the engine. After doing this he will measure particulates to see the result. The applicant did not only measure the total particulate emission, rather in addition also the size of the particulates and **discovered** an effect on nucleation mode particles. Such a **discovery** of an generally known effect (low sulphur/low particles) cannot be regarded as inventive since it is present anyway.